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Materiel Test Procedure 2-3-508
U. S. Army Armor and Engineer Board

U. S. ARMY TEST AND EVALUATION COMMAND
COMMON SERVICE TEST PROCEDURE

STOWAGE

1. OBJECTIVE

The objective of this Materiel Test Procedure (MTP) is to determine the adequacy of stowage facilities provided in or on vehicles.

2. BACKGROUND

The limited amount of space available has always been a major stowage problem, especially for combat vehicles. Other problem areas include adequacy of protection for the stowed item, suitability of the stowage arrangement, and durability of the facilities. Changes to the original design of the vehicle and/or stowed items have also created confusion in the past.

Vehicles, especially combat types, are seldom completely stowed prior to service test. Therefore, it is incumbent upon service test agencies to conduct stowage tests at the earliest practicable date so that changes, if needed, can be incorporated into early production vehicles.

3. REQUIRED EQUIPMENT

- a. All items required to be stowed in or on the test vehicle
- b. Photographic equipment

4. REFERENCES

- A. Pertinent technical manual containing the list of all items to be stowed or a similar list prepared by the vehicle design agency.
- B. Approved qualitative materiel requirement (QMR), small development requirement (SDR) or other approved criteria source documents.
- C. MTP 4-3-517, Combat Vehicle Ammunition Stowage and Transportability.

5. SCOPE

5.1 SUMMARY

This MTP outlines procedures for:

- a. Preparation for Test - Procedures for the preparation of the test item, stowed items, and personnel for testing.
- b. Compatibility - A test to determine whether each item can be readily stowed, properly secured, and withdrawn from the facilities provided.
- c. Operational Reliability - A test to determine whether stowage facilities meet specified durability requirements and whether stowed items are properly protected during vehicle operation.

5.2 LIMITATIONS

This MTP is applicable to all items of vehicle stowage except ammunition,

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Aberdeen Proving Ground, Maryland 21005

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which is covered in MTP 4-3-517, Combat Vehicle Ammunition Stowage and Transportability.

6. PROCEDURES

6.1 PREPARATION FOR TEST

6.1.1 Scheduling

a. Ensure that qualified personnel and proper quantities of all the required items to be stowed in and on the test item are available prior to testing.

b. If possible schedule these procedures to be performed concurrent with other testing of the commodity as applicable.

NOTE: Normally the stowage test is conducted as an integral part of the service test, and check test of the basic vehicle. However, in some cases testing of specific vehicular storage facilities may be conducted separately. In such cases arrangements should be made for the use of the test vehicle, personnel and stowed items, etc. as required to put the test item through the required cycle of testing.

6.1.2 Pretest Inspection

a. Subject all stowage facilities (racks, boxes, bins, brackets, straps, clamps, etc.) and items to be stowed to a thorough cleaning and inspection under good lighting conditions for hairline cracks, breaks, deformities, misalignments, rough surfaces that could affect items being stowed, and for missing or damaged protective pads, etc.

b. Record and photograph defective materiel.

c. Record any repairs and/or replacements to damaged item, as appropriate.

6.1.3 Orientation

Orient test personnel as to the objectives of the test, the data desired, and how these data are to be developed and recorded.

6.1.4 Preparation of Questionnaire

a. On more complex items, prepare a questionnaire covering the human factors engineering and hardware aspects of the test. The purpose of the questionnaire should be to provide a convenient means for recording test data on a timely scheduled basis, while reducing the amount of writing required.

6.2 TEST CONDUCT

Evaluate the stowage characteristics of the test item using the following subtests as applicable:

NOTE: This procedure should be used in conjunction with MTP 4-3-517

Combat Vehicle Ammunition Stowage and Transportability for
Stowage testing of any vehicle with a weapon mounted on it.

6.2.1 Compatibility

Determine the compatibility of the test item (stowage facilities) with its full allowance of stowed items. Using the following criteria, as applicable.

a. Place each item to be stowed, or an acceptable substitute, in the space provided, clamp or strap in place as appropriate and record the following for each stowage item.

NOTE: Use of substitute items should be kept to minimum with weight and shape of these items closely simulating the weight and shape of the actual item, since adverse effects of the stowage facility on the item are reflected more realistically by actual items.

- 1) Physical incompatibilities, such as tight or loose fit within space provided.
- 2) Difficulties encountered in operating the means provided for securing the item.
- 3) Interference from other material.
- 4) Potential hazard to personnel.
- 5) Description of substitute stowage item and how it differs from the actual item, if applicable .
- 6) Reason for the substitution.
- 7) Items for which stowage facilities were not provided.

b. Remove each item from its stowed position and record any difficulties encountered.

c. Repeat steps a and b with test personnel wearing gloves.

d. Record comments and recommendations of test personnel regarding the following:

- 1) Adequacy of space
- 2) Restriction of movement
- 3) Interference from other material
- 4) Adequacy of item/space identification techniques
- 5) Suggestions for improvements

e. Repeat steps a and d above for each alternate mission/configuration and stowage plan applicable to the test item.

NOTE: TOE and TA items and related components to be installed in a vehicle will usually vary for each different role in which a specific vehicle is used within one branch of the Army. For example, it is not uncommon for a vehicle to be used as a command post, message center, air control center, and maintenance section within the same branch of the Army. In addition, the same vehicle may be used in several different roles by

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other branches of the Army. Therefore the TOE and TA of each type unit shown in the QMR for the vehicle should be reviewed, and if necessary, the appropriate Combat Developments Command agency and USCONARC branch schools contacted to ensure that all roles and stowage plans are considered.

6.2.2 Operational Reliability

a. Operate the test vehicle, with a full complement of personnel and with prescribed items or acceptable substitutes stowed, over the number of miles of the types of terrain specified in the QMR, SDR, or other appropriate document. During this phase of testing the vehicle should be operated and/or utilized for all the functions for which it is designed.

NOTE: If criteria are not specified, each stowed item, except ammunition, should be transported the maximum extent practicable and never less than 500 miles. The types of terrain traversed should be as prescribed and in the same ratio as for the vehicle. Transporting of ammunition is covered in MTP 4-3-517.

b. Throughout this phase of testing perform the following:

- 1) Visually inspect each stowed item daily or after each shift and record any evidence of damage.
- 2) Remove and restow each stowed item as necessary to simulate combat and combat support operations. Inspect each stowed item prior to restowing, photograph and record indications of damage or unusual wear.
- 3) When the stowed item is removed, clean the stowage facility and carefully inspect for any indication of damage or unusual wear. Record difficulties encountered with cleaning stowage facility and evidence of damage or unusual wear.
- 4) Check compartments on the exterior of the vehicle for adequacy of sealing against inclement weather and the locking features as effective against theft. Record any defects.
- 5) Maintenance performed on stowage facilities by maintenance level personnel shall be recorded.

c. Repeat these procedures as applicable for each stowed item configuration prescribed for the test item. (See NOTE of paragraph 6.2.1.e)

6.3 TEST DATA

6.3.1 Preparation for Test

6.3.1.1 Pretest Inspection

a. Record the following for each item to be stowed:

- 1) Description of defect
- 2) Action taken:

- a) Maintenance
- b) Repair
- c) Replace

b. Retain all photographs

6.3.2 Test Conduct

6.3.2.1 Compatibility

a. Record the following:

- 1) Vehicle nomenclature and vehicle configuration.
- 2) List of substitute stowage items used with description of how each differs from the actual item.
- 3) Physical incompatibilities, if any, between stowage facilities and items to be stowed to include:
 - a) Problems, if any, concerning space provided (fit too tight or too loose).
 - b) Difficulties, if any, in using the means provided for securing items.
- 4) Difficulties, if any, in stowing item due to its weight or size, or space provided, or interference from other materiel.
- 5) Difficulties, if any, in stowing, securing, and/or removing items without and with gloves.
- 6) Potential safety hazards, if any, due to weight and configurations of item or rough edges, sharp points, etc., on stowage facility.
- 7) Damage, if any, to items during stowing and removing.
- 8) Problems, if any, in reading identification labels for stowage locations.
- 9) List of items, if any, for which stowage facilities were not provided.
- 10) Comments and recommendation of test personnel.

b. Retain all photographs.

6.3.2.2 Reliability

a. Record the following for each stowed item configuration:

- 1) Vehicle nomenclature and configuration
- 2) Number of miles vehicle operated with item stowed on:
 - a) Roads
 - b) Cross country
- 3) Damage, if any, to stowage facilities
- 4) Damage, if any, to stowed materiel

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- 5) Difficulties encountered in cleaning stowage facility.
- 6) Maintenance performed on stowage facilities by maintenance level personnel.
- 7) Adequacy of sealing against inclement weather, and locking features against theft.

b. Retain all photographs.

6.4 DATA REDUCTION AND PRESENTATION

All data obtained by inspection, observation, photographs, and maintenance should be suitably tabulated or otherwise arranged for correlation under the appropriate subtest within the report of test and presented in a manner to indicate whether the test item meets the QMR, SDR, or other applicable criteria.

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13. ABSTRACT This Army Service Test Procedure describes test methods and techniques for evaluating the adequacy of stowage facilities provided in or on military vehicles. Stowage features except for that pertaining to ammunition are considered.			

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